



## 2021 OREGON TSAP UPDATE

DATE: December 15, 2020

TO: Mary McGowan | Oregon DOT

FROM: Brian Chandler and Lacy Brown | DKS Associates

SUBJECT: Final Crash Trend Analysis Report

Project #20020-004

### PURPOSE

The Oregon Department of Transportation (ODOT) is conducting an update of the Transportation Safety Action Plan (TSAP). The TSAP unifies transportation safety planning in Oregon by providing long-term goals, policies, strategies, and near-term actions to eliminate deaths and life-changing injuries.

Updating the TSAP requires an update of associated data and review of crash trends and safety performance to date. The analysis report documents updated safety data; recent and historic trends related to crash types, crash severity, and possible contributing factors; an analysis of the past attainment of safety performance targets; and progress towards future attainment of safety performance targets.

The primary objective of this analysis is to update crash data provided in the 2016 TSAP to the most recent available data, and to identify and analyze any new data sets, as applicable. In this report is a subset of data analyses to update content, tables, and figures for the 2021 TSAP, including the primary data most useful for comparing the previous data set (2009-2013) to the current data (2014-2018). The result of this analysis will be up-to-date, analyzed, reportable data for the 2021 TSAP.

## DATA SET FOR ANALYSIS OF CRASH TRENDS AND SAFETY PERFORMANCE

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The DKS team analyzed the most recent 5 years of data (2014-2018) for all reported crashes in Oregon at the statewide level and by ODOT region. The team obtained data from the ODOT Crash Analysis Reporting System (CARS) Unit. Details for individual queries were provided in the September 22, 2020, technical memorandum entitled *Final Crash Trend and Performance Target Analysis Methodology*.

Known changes to definitions and flags from the 2009-2013 crash data set to the 2014-2018 data set include the following:

- **Reporting Threshold.** From 1/1/2004 through 12/31/2016, drivers were required to file a report when damage to the driver's vehicle was over \$1,500; damage to any vehicle was over \$1,500 and any vehicle was towed from the scene as a result of damage; if injury or death resulted from the accident; or if damage to any one person's property other than a vehicle involved in the accident was over \$1,500. As of 1/1/2018 and in the present, legally reportable motor vehicle traffic crashes are those involving death, bodily injury, damage to personal property in excess of \$2,500; or damage to any vehicle over \$2500 and any vehicle is towed from the scene as a result of damage. Drivers are required to file an Accident and Insurance Report Form with DMV within 72 hours of a traffic crash.<sup>1</sup>
- **Property Damage Only Crashes Lack Some Participant and Vehicle Details.** As of 2016, many participant-level and vehicle-level details are no longer coded for non-injury crashes. Some crash attributes (e.g., aggressive driving, distraction, safety equipment use) may be captured only at the *Crash* level if it is a primary contributing factor, but not the *Participant* level.
  - **Crash level** is focused on the event itself and includes data elements like date, time of day, weather conditions, etc.
  - **Participant level** includes detailed information about each participant (e.g., driver, passenger, pedestrian), including age, impairment, use of safety equipment like seat belts, etc.

For example, in the case of driver age, this means that queries for the number of crashes involving older driver or the number of older drivers will under-represent older driver behavior in property damage only crashes. As a result, observed changes in older driver trends could be, instead, reflective of changes to the crash database.

- **ODOT-provided Roadway Departure Flag.** ODOT currently uses a flag, *LANE\_RDWY\_DPRT\_CRASH\_FLG*, to identify roadway departure crashes. The 2009-2013 analysis excluded bicycle/pedestrian crashes from the definition of Roadway or Lane

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<sup>1</sup> ODOT Crash Code Manual

Departure Crashes.<sup>2</sup> This new flag does not exclude these crash types. For example, if a vehicle left the roadway and struck a pedestrian, the crash would be coded as a pedestrian crash and the roadway departure flag would be “true”.

- **ODOT-provided Distracted Driving Query.** ODOT provided the study team a detailed query to identify crashes that involve a distracted driver. That detailed query was not available for the 2009-2013 crash data analysis.
- **Marijuana-involved Crash.** ODOT developed a new flag, *MJ\_INVLV\_FLG*, to identify those crashes where evidence of marijuana use by at least one driver was captured. This information is only available for the most recent years of the crash database (2016 [partial], 2017, and 2018), so it cannot be analyzed with the other attributes.
- **Vulnerable User Definition.** The current ODOT definition for vulnerable user includes pedestrians, cyclists, and motorcyclists. Motorcyclists were not included in discussions of vulnerable users in the previous TSAP.

DKS rectified these issues by requesting the full, up-to-date 2009-2013 data set as well. All comparisons described below include the same queries run on the two 5-year data sets.

## BASIC SAFETY SUMMMARY

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Analysis of the 2014-2018 crash data resulted in the following basic data for the study period:

- Oregon suffered 2,028 fatal crash events and 7,458 serious injury crash events.
  - Those events resulted in 2,240 fatalities and 8,695 serious injuries. For comparison, from 2009-2013 Oregon experienced 1,675 fatalities and 7,191 serious injuries.
- Vulnerable Users. 2014-2018
  - Pedestrians (number killed or seriously injured): 355 fatalities, 598 serious injuries
  - Bicyclists (number killed or seriously injured): 44 fatalities, 290 serious injuries
  - Motorcyclists (number killed or seriously injured): 300 fatalities, 1,112 serious injuries
- For 2014-2018, Roadway departure crashes and intersection crashes continue to be the most prevalent types in Oregon.
- Urban/Rural Distribution
  - The proportion of fatalities (people killed) and serious injuries (people seriously injured) has shifted significantly from rural to urban.

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<sup>2</sup> This was a decision made by the TSAP project team (not ODOT CARS) for the 2016 TSAP.

- 2009-2013: 48% Urban, 52% Rural
- 2014-2018: 56% Urban, 44% Rural
- Similar proportion shifts show up with looking at fatal crash events and serious injury crash events.
  - 2009-2013: 51% Urban, 49% Rural
  - 2014-2018: 59% Urban, 41% Rural
- The reasons behind this shift from rural to urban are numerous, including the following:
  - The results of the 2010 Census showed a significant expansion of urban & urbanized areas in Oregon. Three new Urbanized (Large Urban) areas were added; and most of the existing Urbanized areas were expanded. Seven new Small Urban areas were added.
  - Information was updated incrementally in the State's highway inventory, but not released to the Crash Data System until 2014-2015, which is why there is a shift between the 2009-2013 and 2014-2018 crash data results.
  - Change in population and vehicle miles traveled in urban and rural areas (combined with the information provide above).
  - A population shift from rural to urban has been identified, at least anecdotally.

## CRASH DISTRIBUTION BY FUNCTIONAL CLASS AND ODOT REGION

We compared the proportion of fatal and serious injury crashes by roadway functional classification. Table 1 shows these values and the changes from 2009-2013 to 2014-2018.

**TABLE 1. PROPORTION OF FATAL AND SERIOUS INJURY CRASHES BY FUNCTIONAL CLASS**

Functional Class	2009-2013 Proportion of Total	2014-2018 Proportion of Total	Difference in Proportion
Rural Interstate	3%	3%	-
Urban Interstate	3%	5%	+2%
Rural Freeway/Expressway	0%	0%	-
Urban Freeway/Expressway	1%	2%	+1%
Rural Principal Arterial	17%	14%	-3%
Urban Principal Arterial	19%	23%	+4%
Rural Minor Arterial	10%	8%	-2%
Urban Minor Arterial	14%	16%	+2%
Rural Collector	15%	13%	-2%
Urban Collector	8%	8%	-
Rural Local	7%	3%	-4%
Urban Local	6%	4%	+2%

Each ODOT Region works with their stakeholders to address local safety issues. Following are the changes in the number of fatal and serious injury crashes in each region, comparing the 2009-2013 data set to 2014-2018.

**TABLE 2. FATAL AND SERIOUS INJURY CRASH EVENTS BY REGION**

Region	2009-2013 Fatal and Serious Injury Crashes	2014-2018 Fatal and Serious Injury Crashes	Difference
1	2,629	3,082	+453
2	2,542	3,498	+956
3	1,223	1,369	+146
4	768	963	+195
5	498	574	+76
Total <sup>3</sup>	7,661	9,486	1,825

<sup>3</sup> One crash was at an unknown location, so Region information is unavailable. Thus, the total for 2009-2013 includes one more than the sum of regions 1-5. As a result, the total change in the number of fatal and serious injury crashes is 1,825.

## CRASH TYPES, ATTRIBUTES, AND CONTRIBUTING FACTORS

Following are recent and historic trends related to crash types and possible contributing factors for fatal and serious injury crashes. The consultant team analyzed the current ODOT crash database to calculate 2009-2013 and 2014-2018 values with support from ODOT Crash Analysis Unit and ODOT Traffic-Roadway Section.

**TABLE 3. FATAL AND SERIOUS INJURY CRASHES, CRASH ATTRIBUTE COMPARISON, 2009-2013 AND 2014-2018**

Fatal and Serious Injury Crash Attributes	2009-2013 Total	2009-2013 Proportion of Total	2014-2018 Total	2014-2018 Proportion of Total	Difference (total)	Difference (proportion)
Roadway Departure Crashes	3,381	44.1%	3,888	41.0%	+507	-3.1%
Intersection Crashes	2,631	34.3%	3,413	36.0%	+782	+1.7%
Speed-Related Crashes	2,132	27.8%	2,251	23.7%	+119	-4.1%
Alcohol Involved Crashes	1,445	18.8%	1,650	17.4%	+205	-1.4%
Crashes with Alcohol Involved, but No Drugs Identified	1,254	18.9%	1,335	17.4%	+205	-1.5%
Crashes with Alcohol and/or Other Drugs Involved	1,695	22.1%	2,121	22.4%	+426	+0.3%
Crashes Involving a Young Driver (age 15-20)	1,124	14.7%	1,350	14.2%	+226	-0.4%
Crashes Involving a Young Driver (age 21-25)	1,256	16.3%	1,640	17.3%	+384	+0.9%
Crashes Involving an Older Driver (age 65+)	1,498	19.5%	2,082	21.9%	+584	+2.4%
Crashes Involving Pedestrians Seriously Injured or Killed	760	9.9%	926	9.8%	+166	-0.1%
Crashes Involving Bicyclists Seriously injured or Killed	332	4.3%	333	3.5%	+1	-0.8%
Crashes Involving Unlicensed Drivers	628	8.2%	1,015	10.7%	+387	+2.5%
Commercial Motor Vehicle Involved Crashes	402	5.2%	527	5.6%	+125	+0.3%
Work Zone Involved Crashes	119	1.6%	121	1.3%	+2	-0.3%
Motorcycle Involved Crashes	1,170	15.3%	1,366	14.4%	+196	-0.9%
School Bus or School Zone Involved Crashes	44	0.6%	68	0.7%	+24	+0.1%
Crashes Involving a Distracted Driver	505	6.6%	806	8.5%	+301	+1.9%

**TABLE 4. FATALITIES AND SERIOUS INJURIES (PERSON-BASED), 2009-2013 AND 2014-2018**

Crash Attributes	2009-2013 Total	2009-2013 Proportion of Total	2014-2018 Total	2014-2018 Proportion of Total	Difference (total)	Difference (proportion)
Pedestrian(s) Seriously Injured or Killed	791	8.9%	953	8.7%	+162	-0.2%
Bicyclists(s) Seriously Injured or Killed	332	3.7%	334	3.1%	+2	-0.7%
Motorcyclists Seriously Injured or Killed	1,216	13.7%	1,412	12.9%	+196	-0.8%
All F&A Causalities in Older Driver-Involved Crashes	1,757	19.8%	2,436	22.3%	+679	+2.5%
Older Drivers Seriously Injured or Killed	864	9.7%	1246	11.4%	+382	+1.6%
Unrestrained Passenger Vehicle Occupants (Drivers or Passengers) Seriously Injured or Killed	793	8.9%	874	8.0%	+81	-1.0%

The study team identified a few notable changes from the 2009-2013 data to the 2014-2018 data:

- The increases in number of people killed (1,675 to 2,240) and people seriously injured (7,191 to 8,695) coincided with similar national trends.
- The proportion of speed-related fatal and serious injury crashes as gone down, from 27.0% to 23.7%.
- Fatal and serious injury crashes occurring at intersections increased by number (780 more) and by proportion (1.6%).
- The number of fatal and serious injury crashes involving unlicensed drivers has increased significantly, from 628 to 1,015.
- Older Driver (65+)-involved fatal and serious injury crashes increased from 1,498 to 2,082.
- The number of fatal and serious injury crashes involving alcohol and/or other drugs increased by 426 (1,695 to 2,121), and the proportion increased from 22.1% to 22.4% - one of few categories to increase in proportion.
- The number of pedestrians killed or seriously injured in reported crashes increased between study periods (791 to 953), but the proportion of all persons killed or seriously injured in crashes who were pedestrians went down (10% to 8.7%).
- The number of bicyclists killed or seriously injured in reported crashes was nearly the same in each study period (increased from 332 to 334). The proportion reduced from 3.7% to 3.1%.

## SAFETY PERFORMANCE MEASURES: TARGET ATTAINMENT, TARGET SETTING

As described by FHWA:

“Each State’s safety performance target assessment is based on its own State-specific target methodology and program philosophy. Therefore, conclusions should not be drawn based only on the information in the Safety Performance Target Assessment Summary table. For example, the State may have set aggressive targets, and not met those targets, while another State may have set more easily attainable targets and met those targets. FHWA understands that each State’s safety program is unique and therefore does not prescribe a methodology for States to set targets. States have the flexibility to use the methodology they deem most appropriate when setting their safety performance targets.”<sup>4</sup>

Based on the most recent data available, FHWA Performance Measures are provided in Table 5

**TABLE 5. OREGON SAFETY PERFORMANCE TARGET ASSESSMENT SUMMARY**

PERFORMANCE MEASURE	2014-2018 TARGET	2014-2018 OUTCOME	2012-2016 BASELINE	MET TARGET?	BETTER THAN BASELINE?	MET OR MADE SIGNIFICANT PROGRESS?
Number of Fatalities	350.0	449.2	390.2	No	No	NO
Rate of Fatalities	0.890	1.238	1.116	No	No	
Number of Serious Injuries	1,461.0	1,736.8	1,655.8	No	No	
Rate of Serious Injuries	4.300	4.796	4.742	No	No	
Number of Non-Motorized Fatalities and Serious Injuries	229.0	257.6	252.8	No	No	

Source: State Highway Safety Report (2018) – Oregon, Federal Highway Administration.

<https://www.fhwa.dot.gov/tpm/reporting/state/safety.cfm?state=Oregon>

For context, the impacts of the 2008 economic recession drove Oregon’s VMT and traffic crashes down during 2009-2013. Increases in reported crashes may be due, in part, to:

- Oregon’s economic recovery, which occurred over a span of years and coincided with increases in VMT and traffic crashes.
- An improvement in an internal departmental process circa 2011, which allowed non-fatal crash reports that would otherwise have been withheld, to be released to the ODOT Crash Analysis Unit for inclusion in the annual data file.
- A 9.9% increase in population growth, which could have impacted the number of casualties in traffic crashes.
  - Oregon’s population grew 2.7% from 2009 through 2013.
  - The population grew 5.9% from 2014 through 2018.
  - The percent change from 2009 to 2018 was 9.9%

<sup>4</sup> State Highway Safety Report (2018) – Oregon, Federal Highway Administration.

<https://www.fhwa.dot.gov/tpm/reporting/state/safety.cfm?state=Oregon>



As part of this project, the study team will work with ODOT and safety stakeholders to determine the most appropriate target setting and display of information for the 2021 TSAP.

## **NEXT STEPS**

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Upon completion of all crash data queries, confirmation of definitions, and analysis of results, the consultant will use the final analysis for the following project purposes:

- Support Task 4 Technical Memos and other associated reports and memos with updated crash trend analysis.
- Update all data-required content, tables, and figures in the 2021 TSAP.